EXHIBIT C

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	
Raymond G. Gallagher	
Serial No. 09/399,545	PATENT APPLICATION
Filed: September 20, 1999	Group Art Unit: 3621
For: SPACER FRAME FOR AN INSULATING UNIT HAVING STRENGTHENED SIDEWALLS TO RESIST TORSIONAL TWIST	Examiner: Not Assigned
	Atty. Docket No. 1185R1

SUPPLEMENTAL REISSUE DECLARATION UNDER 36 CFR 1.175

Assistant Commissioner for Patents
Washington, DC 20231

Dear Sir:

I, Raymond G. Gallagher, applicant of the above-identified application, have been advised by Mr. Donald C. Lepiane, attorney of record in the above-identified application, that the reissue application was filed without the claims of U.S. Patent No. 5,813,191;

That claims of U.S. Patent No. 5,813,191 are attached hereto along with new claims 35-55 presently on file, whereby I declare:

That I am a citizen of the United States of America residing in respectively, Pittsburgh, Allegheny County, Pennsylvania;

That I believe myself to be the original inventor of the invention described and claimed in Letters Patent No. 5,813,191 and the foregoing specification and for which invention I solicit a reissue patent;

That I have reviewed and understand the contents of the claims of U.S. Patent No. 5,813,191 including the claims being added by this reissue;

That I do not know and do not believe that said invention was ever known or used in the United States of America before my invention thereof;

That I acknowledge a duty to disclose information of which I am aware which is material to the examination of the application;

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application of any patent issuing thereon.

Full name of sole inventor: Raymond G. Gallagher

Inventor's Signature Raymond G. Gallagher 12/3/99
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The spacer stock 262 is bent at the corner portions 284 and 286, at the corner portion 282 and thereafter at the corner portion 280 while the tapered end 260 is telescoped into the end 264 of the spacer stock 262 to form the spacer frame having continuous corners.

The holes 254 and 256 are aligned with each other and may be sealed with polyisobutylene, and/or joined with a close end rivet or screw. The outer glass sheets 24 and 26 are thereafter positioned over the layer 46 and biased toward one another to flow the layer 46 to secure the outer glass sheets to the legs 30 and 32 of the spacer frame. Thereafter the sealant-adhesive 50 is flowed into the channel formed by the marginal edge portions of the outer sheets 24 and 26 and the outer surface 52 and base 34 of the spacer frame 22.

With reference to FIG. 12, there is shown another embodiment of the spacer stock of the instant invention. Spacer stock 320 of FIG. 12 has "V" shape cut outs at expected corner 322. With this arrangement there are no portions of the sidewalls bent over the base as was discussed for the spacer stock 262 of FIG. 11. Also in FIG. 12 there is shown by dotted line designated by numeral 324, the end of the second member of the outer legs terminating short of the first member of the outer legs. As can now be appreciated, the spaced distance between the first and second members at expected corners of the spacer frame is not limiting to the invention.

As can now be appreciated, the embodiments of the invention present are for purposes of illustration only and are not limiting to the invention and other embodiments are contemplated by the invention and within the scope of the claimed invention.

What is claimed is:

1. An elongated spacer stock used in the manufacture of a spacer frame to separate sheets of an insulating unit, the spacer stock comprising:

an elongated base;

a first elongated leg having a first member and a second member joined together to have a generally U-shaped cross section;

a second elongated leg having a first member and a second member joined together to have a generally U-shaped cross section; wherein

the first and second legs are spaced from and out of contact with one another and joined to the base to provide a generally U-shaped cross section with open end of the U formed by the first and second legs and base in a first direction, the U shape of the first leg open in a second direction, and the U-shape of second leg open in the second direction with the first and second directions opposite to one another, and the first and second legs spaced from and out of contact with one another.

2. The spacer stock of claim 1 wherein the first member of the first and second legs is joined to the second member of the first and second legs by a radiused portion.

3. The spacer stock of claim 2 wherein the first and second members of the first and second legs are spaced from one another.

4. The spacer stock of claim 3 wherein the end of the second member of the first and second legs is radiused.

5. The spacer stock of claim 4 wherein the radiused end of the second member of the first and second legs contacts surface of the base between the first and second legs.

6. The spacer stock of claim 4 wherein the radiused end of the second member of the first and second member are spaced from the surface of the base between the first and second legs.

7. The spacer stock of claim 1 wherein the first and second members of each of the first and second legs are in contact with one another.

8. An elongated spacer stock used in the manufacture of a spacer frame to separate sheets of an insulating unit, the spacer stock comprising:

a base:

a first leg connected to the base; and

a second leg connected to the base and spaced from the first leg, wherein the legs and the base are connected to provide a generally U-shaped cross-section, wherein the first and second legs have a thickness greater than the thickness of the base to reduce torsional twist of the spacer stock.

9. The spacer stock of claim 1 wherein the spacer stock has a continuous base and portions of the second member are removed at positions along the spacer stock that form corners when the spacer stock is bent into a spacer frame.

10. The spacer stock of claim 9 wherein the first member at corners has weaking lines arranged to have a generally "V" shape.

11. The spacer stock of claim 9 wherein the first member has a cut out portion at the positions along the spacer stock that form corners when the spacer stock is bent into a spacer frame.

12. The spacer stock of claim 1 wherein the base has a "T" shaped cross section extending upwardly between the first and second legs, and is spaced from and out of contact with the first and second legs.

13. A spacer frame for separating sheets of an insulating unit, the spacer frame comprising:

a base;

a first leg connected to the base, the first leg having a first member and a second member joined together to have a generally U-shaped cross section;

a second leg connected to the base, the second leg having a first member and a second member joined together to have a generally U-shaped cross section; wherein

the first and second legs are spaced from and out of contact with one another and connected to the base to provide the spacer frame with a generally U-shaped cross section with open end facing in a first direction and opening of U of the first and second legs facing in a second direction opposite to the first direction to reduce torsional twist.

14. The spacer stock of claim 13 wherein the first member is joined to the second member by a radiused portion.

15. The spacer stock of claim 14 wherein the first and second legs each include:

a first member joined to a second member to have a generally hairpin configuration with the first member joined to the base.

16. The spacer stock of claim 15 wherein:

the end of the second member is radiused, and

the radiused end of the second member is out of contact with the base.

17. The spacer frame of claim 13 wherein the spacer frame has corners and the base is continuous around the corners of the spacer frame.

18. The spacer frame of claim 17 wherein the portions of the outer legs are bent toward one another over the base.

19. The spacer frame of claim 18 wherein portions of the second member are removed at the corners and portions of the first member are bent over the base.

20. The spacer frame of claim 16 wherein a bead of moisture pervious material having a desiccant is deposited

on the surface of the base between the first and second legs defined as inner surface of the base, and the bead having portions between the radiused end of the second member of the first and second legs and the inner surface of the base.

21. An insulating unit comprising:

a pair of sheets;

a spacer frame between the pair of sheets, and the spacer frame comprising:

a base;

a first leg

a second leg; wherein

the first and second legs are spaced from and out of contact with one another and joined to the base to provide the spacer frame in cross section with a generally U-shaped cross section with the open end of the U facing a first direction and the first and second legs each including a first U-shaped member having two ends, one end attached to the base and the remaining end joined by a radiused portion to the second member such that the members form a generally U-shaped cross-sectional configuration with the opening of the U facing a second direction opposite to the first direction to reduce torsional twist, and

means for securing the sheets to the spacer frame.

22. The insulating unit of claim 21 wherein the securing means include a moisture impervious sealant securing the sheets to the first and second legs of spacer frame.

23. The insulating unit of claim 20 further including a bead of a moisture pervious material having a desiccant mounted on surface of the base between the first and second legs.

24. The insulating unit of claim 21 wherein the first and second legs each include:

a first member joined to a second member to have a generally hairpin configuration with the first member joined to the base and the second member having an end positioned relative to the base.

25. The insulating unit of claim 24 wherein the first member is joined to the second member by a radiused portion.

26. The insulating unit of claim 25 wherein:

the first and second members are spaced from one another to provide the first and second legs with a hairpin cross sectional configuration;

the end of the second member is radiused, and

the radiused end is spaced from and out of contact with the base.

27. The insulating unit of claim 26 wherein the spacer frame has corners and the base is continuous around the corners.

28. The insulating unit of claim 23 wherein the bead is between the ends of the second member and the inner surface of the base.

29. The insulating unit of claim 28 wherein the bead is a moisture pervious adhesive.

30. The insulating unit of claim 29 wherein the unit has a low thermal conducting edge.

31. The insulating unit of claim 29 further including a sheet mounted between the legs within the frame.

32. A method of making and using a spacer stock comprising the steps of:

providing a strip of bendable material and

shaping the strip to provide an elongated piece of spacer stock having a base, a first leg and a second leg, the base and legs joined to provide the spacer stock with a generally U-shaped cross section with the U open in a first direction and the first and second legs spaced from one another and out of contact with one another, and the legs each having a first member joined to a second member to have a U-shaped cross section with the opening of the U in a second direction opposite to the first direction to reduce torsional twist of the spacer stock.

33. The method set forth in claim 32 further including the steps of:

identifying corner positions on the elongated piece of spacer stock;

removing portions of the second member at the corner positions, and

bending the spacer stock at the corner positions to provide a spacer frame.

34. The method as set forth in claim 33 further including the step of:

securing a sheet to outer surface of each of the legs to provide an insulating unit.

* * * * *

35. An elongated spacer stock used in the manufacture of a spacer frame to space sheets of an insulating unit, the spacer stock comprising:

an elongated base having a supporting surface;

an elongated first leg having a first elongated member joined to the elongated base and a second elongated member joined to the first elongated member of the first leg and having an end portion positioned over the supporting surface of the base;

an elongated second leg having a first member joined to the elongated base and a second elongated member joined to the first elongated member of the second leg and having an end portion positioned over the supporting surface of the base, the first member of the first leg and the first member of the second leg and the base joined together to have a U-shaped cross section; and

a bead on the supporting surface of the base with portions of the bead between the supporting surface of the base and the end portion of the second legs of the first and second members.

36. The spacer stock of claim 35 wherein the end portions of at least one of the second members of the first or second legs limits movement of the bead away from the supporting surface of the base.

37. The spacer stock of claim 36 wherein the bead is made of a moisture pervious material.

38. The spacer stock of claim 37 wherein the bead has desiccant therein.

39. The spacer stock of claim 37 wherein the moisture pervious material is a moisture pervious adhesive.

40. The spacer stock of claim 35 wherein the spacer stock has a length sufficient to provide a closed spacer frame for the insulating unit.

41. The spacer stock of claim 40 wherein the spacer stock has a first end and an opposite end defined as a second end and the first and second ends are to be joined to provide the closed spacer frame wherein the base is continuous from the first end to the opposite end.

42. A spacer frame to space sheets of an insulating unit comprising:

an elongated base having a supporting surface;

an elongated first leg having a first elongated member joined to the elongated base and a second elongated member joined to the first elongated member of the first leg and having an end portion positioned over the supporting surface of the base;

an elongated second leg having a first member joined to the elongated base and a second elongated member joined to the first elongated member of the second leg and having an end portion positioned over the supporting surface of the base, the first member of the first leg and the first member of the second leg and the base joined together to have a U-shaped cross section; and

a bead on the supporting surface of the base with portions of the base between the supporting surface of the base and the end portion of the second legs of the first and second members.

43. The spacer stock of claim 35 wherein the end portions of at least one of the second members of the first or second legs limits movement of the bead away from the supporting surface of the base.

44. The spacer stock of claim 36 wherein the bead is made of a moisture pervious material.

45. The spacer stock of claim 37 wherein the bead has desiccant therein.

46. The spacer stock of claim 37 wherein the moisture pervious material is a moisture pervious adhesive.

47. The spacer stock of claim 35 wherein the spacer stock has a length sufficient to provide a closed spacer frame for the insulating unit.

48. The spacer stock of claim 40 wherein the spacer stock has a first end and an opposite end defined as a second end and the first and second ends are to be joined to provide the closed spacer frame wherein the base is continuous from the first end to the opposite end.

49. An insulating unit comprising:

a pair of sheets;

a spacer frame between and adhered to the pair of sheets by an adhesive, the spacer frame comprising:

an elongated base having a supporting surface;

an elongated first leg having a first elongated member joined to the elongated base and a second elongated member joined to the first elongated member of the first leg and having an end portion positioned over the supporting surface of the base;

an elongated second leg having a first member joined to the elongated base and a second elongated member joined to the first elongated member of the second leg and having an end portion positioned over the supporting surface of the base, the first member of the first leg and the first member of the second

leg and the base joined together to have a U-shaped cross section; and

a bead on the supporting surface of the base with portions of the bead on the supporting surface of the base and the end portion of the second legs of the first and second members.

50. The spacer stock of claim 35 wherein the end portions of at least one of the second members of the first or second legs limits movement of the bead away from the supporting surface of the base.

51. The spacer stock of claim 36 wherein the bead is made of a moisture pervious material.

52. The spacer stock of claim 37 wherein the bead has desiccant therein.

53. The spacer stock of claim 37 wherein the moisture pervious material is a moisture pervious adhesive.

54. The spacer stock of claim 35 wherein the spacer stock has a length sufficient to provide a closed spacer frame for the insulating unit.

55. The spacer stock of claim 40 wherein the spacer stock has a first end and an opposite end defined as a second end and the first and second ends are to be joined to

provide the closed spacer frame wherein the base is continuous from the first end to the opposite end.